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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,191	07/15/2003	Shinichi Imai	60188-578	4939

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MCDERMOTT WILL & EMERY LLP  
600 13TH STREET, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER
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VON BUHR, MARIA N

ART UNIT	PAPER NUMBER
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2125

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/619,191

Applicant(s)

IMAI ET AL.

Examiner

M.N. Von Buhr

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9,10,12-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9,10,12-16 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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**DETAILED ACTION**

1. Examiner acknowledges receipt of Applicant's response to the previous Office action, received 19 October 2006; which cancels claims 1-8, 11, 17 and 19-34. Claims 9, 10, 12-16 and 18 remain pending in this application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. In response to Applicant's amendment, the 35 U.S.C. §112, second paragraph, rejection of claims 3, 11, 21 and 29 is withdrawn as being moot, in view of the cancellation of these claims.
4. Further in response to Applicant's amendment, the 35 U.S.C. §§102(e) and 103(a) rejections of claims 1-8, 11, 17 and 19-34, as being either anticipated by or unpatentable over Funk et al. (U.S. Patent Application Publication No. 2005/0171627), either alone or in combination with Funk (U.S. Patent Application Publication No. 2004/0267399) and/or Bourg, Jr. et al. (U.S. Patent Application Publication No. 2004/0091135), are withdrawn as being moot, in view of the cancellation of these claims.
5. In response to Applicant's amendment and remarks, concerning the 35 U.S.C. §102(e) rejection of claims 9, 10, 12-16 and 18, as being clearly anticipated by Funk et al. (U.S. Patent Application Publication No. 2005/0171627), Examiner notes the following:
  - a. As presented in the previous Office action, Funk et al. teach that "facility control is often performed by a number of different control systems having a variety of controllers. Some of the control systems may have man-machine interfaces such as touch screens, while others may only collect and display one variable such as temperature. The monitoring system must be able to collect data tabulated for the process control system. The data collection of the monitoring system must handle univariate and multivariate data, the analysis and display of the data, and have the ability to select the process variables to collect. Various conditions in a process are monitored by different sensors provided in each of the process chambers, and data of the monitored conditions is transferred and accumulated in a control computer. If the process data is displayed and detected automatically, the optimum process conditions of a mass-production line can be set and controlled through statistical process control (SPC) charts. Inefficient monitoring of a facility can result in facility downtimes that add to the overall operational cost" (paragraph 7), and provide for "a tool status monitoring system for monitoring a processing tool in a semiconductor processing system, the tool status monitoring system comprising: a plurality of sensors coupled to the processing tool; means for executing a tool health control strategy including means for executing a data collection plan for collecting

tool health data, and means for executing a data pre-processing plan for pre-processing the collected tool health data, the data collection plan comprising a sensor plan for controlling the data collected by the plurality of sensors; means for executing a tool health analysis strategy including means for executing a analysis plan for analyzing the tool health data and means for executing a judgment plan for determining if an alarm has occurred; and an intervention manager for pausing the processing tool when an alarm has occurred and refraining from pausing the processing tool when an alarm has not occurred” (paragraph 9). These functions are accomplished by an APC server that “comprises at least one computer and software that supports multiple process tools; collects and synchronizes data from tools, process modules, sensors, and probes; stores data in a database, enables the user to view existing charts; and provides fault detection. For example, APC server 160 can comprise operational software, such as the Ingenio software, from Tokyo Electron. The APC server allows online system configuration, online lot-to-lot fault detection, online wafer-to-wafer fault detection, online database management, and performs multivariate analysis of summary data using models based upon historical data. In addition, the tool status monitoring system allows real-time monitoring of the processing tools” (paragraph 66). See also, at least, paragraphs 36, 38-43, 46, 55, 82-86 and 99.

b. Applicant argues that “Funk '627 merely discloses ‘multivariate analysis of summary data’ at paragraph 66, and does not disclose or suggest ‘data dividing means.’ As explained in the specification, in the present invention the data dividing means operates to divide the data for respective process parameters and process steps as shown in Figure 11 block P35, and as discussed in the specification at paragraph [0065] which states ‘dividing the process data for the respective process parameters and for respective steps of the process recipe.’ Clearly there is no corresponding element in Funk '627. Moreover, such a data dividing process is not inherent in the multivariate data analysis disclosed by Funk '627” (spanning pages 6-7 of the instant response). This argument is not persuasive.

c. Specifically, Funk et al. teach that “FIG. 2 shows a simplified view of a flow diagram for a monitoring process for processing tools in a semiconductor processing system in accordance with one embodiment of the present invention. The software and associated GUI screens provides a procedure for monitoring one or more processing tools in the system. The flow chart illustrates an exemplary Control Strategy procedure that is executed in the monitoring process. Procedure 200 starts in 210. Procedure 200 can be performed for each production step being performed by a processing tool in the semiconductor processing system. A production step is an etching process, a deposition process, a diffusion process, a cleaning process, a measurement process, a transfer process, or other semiconductor manufacturing process. Strategies define what happens during a set of sequences on the processing tool. Strategies can define a set of sequences for a single wafer, a single tool, a single lot, or a combination of tool activities. A strategy can

include a combination of processing activities, measurement activities, pre-conditioning activities, pre-measurement activities, and post-measurement activities. Each part (group of activities) in a strategy is called a plan. Strategies are associated with a context. Context information can be used to associate a given operation with another operation. In particular, the context information associates a process step or recipe with one or more strategies and/or plans. In 215, a control strategy is determined based on a process context. The process context can be dependent upon the production step being performed and the tool being monitored. The context determines which strategy and/or plan is executed for a particular process recipe ... The control strategy can be a holder of plans. A control strategy and the associated plans 'control' which sensors are used, how they are configured, which data is collected, and how the data is preprocessed" (paragraphs 89-93). In other words, Funk et al. teach that all the data collected from a semiconductor manufacturing process is grouped based upon the step/tool/wafer or combination thereof which is being monitored, and that such grouped data from the data acquisition process is then used in the multivariate analysis. This is deemed to be analogous to the operation of the instantly claimed "dividing means."

d. Accordingly, claims 9, 10, 12-16 and 18 stand rejected under 35 U.S.C. §102(e), as being clearly anticipated by Funk et al. (U.S. Patent Application Publication No. 2005/0171627).

6. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. Applicant is advised to carefully review the cited art, as evidence of the state of the art, in preparation for responding to this Office action. Applicant's attention is particularly directed to Sakano et al. (U.S. Patent No. 7,054,786), which discloses an "operation monitoring method for treatment apparatus," which utilizes principal component analysis, wherein "operation of a processing system" is monitored "by utilizing a plurality of detected values as operation data, the detected values being detected for every object to be processed by means of a plurality of detectors provided in the processing system, the method comprising the steps of: dividing the operation data into relatively high contribution principal components and low contribution principal components; deriving a residual matrix of operation data belonging to the low contribution principal components; and evaluating an operation state of the processing system on the basis of a residual score obtained by the residual matrix" (col. 3, lines 15-26).

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR §1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR §1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M.N. Von Buhr whose telephone number is 571-272-3755. The examiner can normally be reached on M-F (9am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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